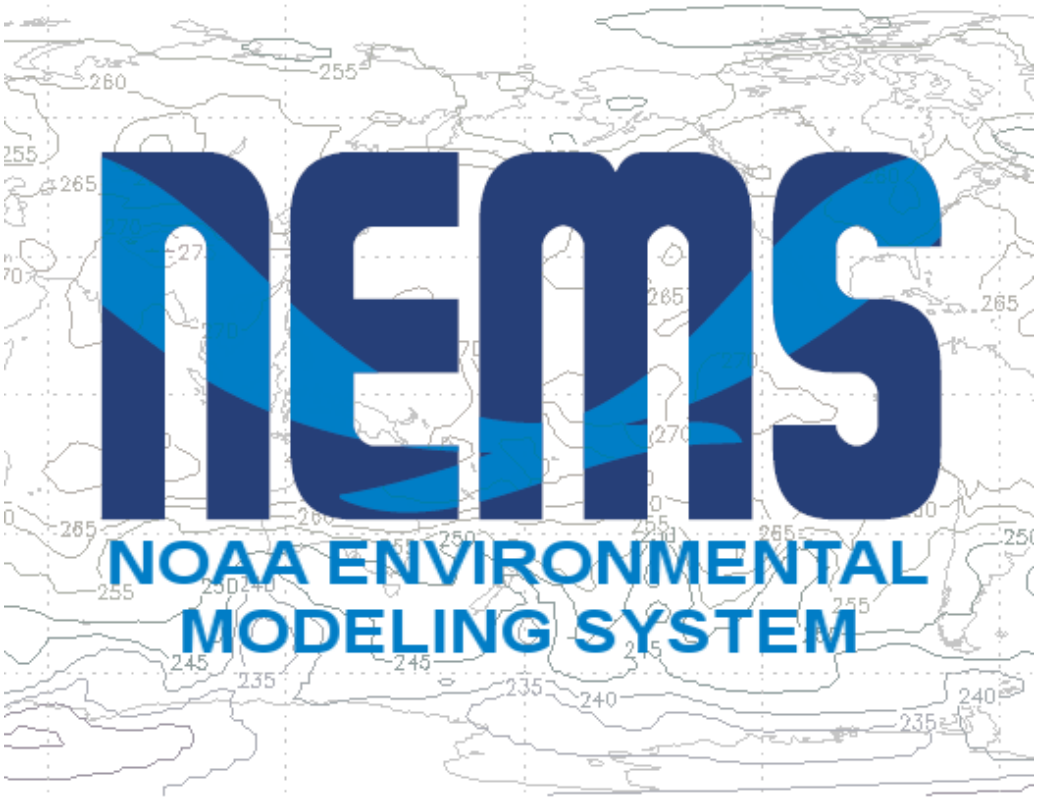


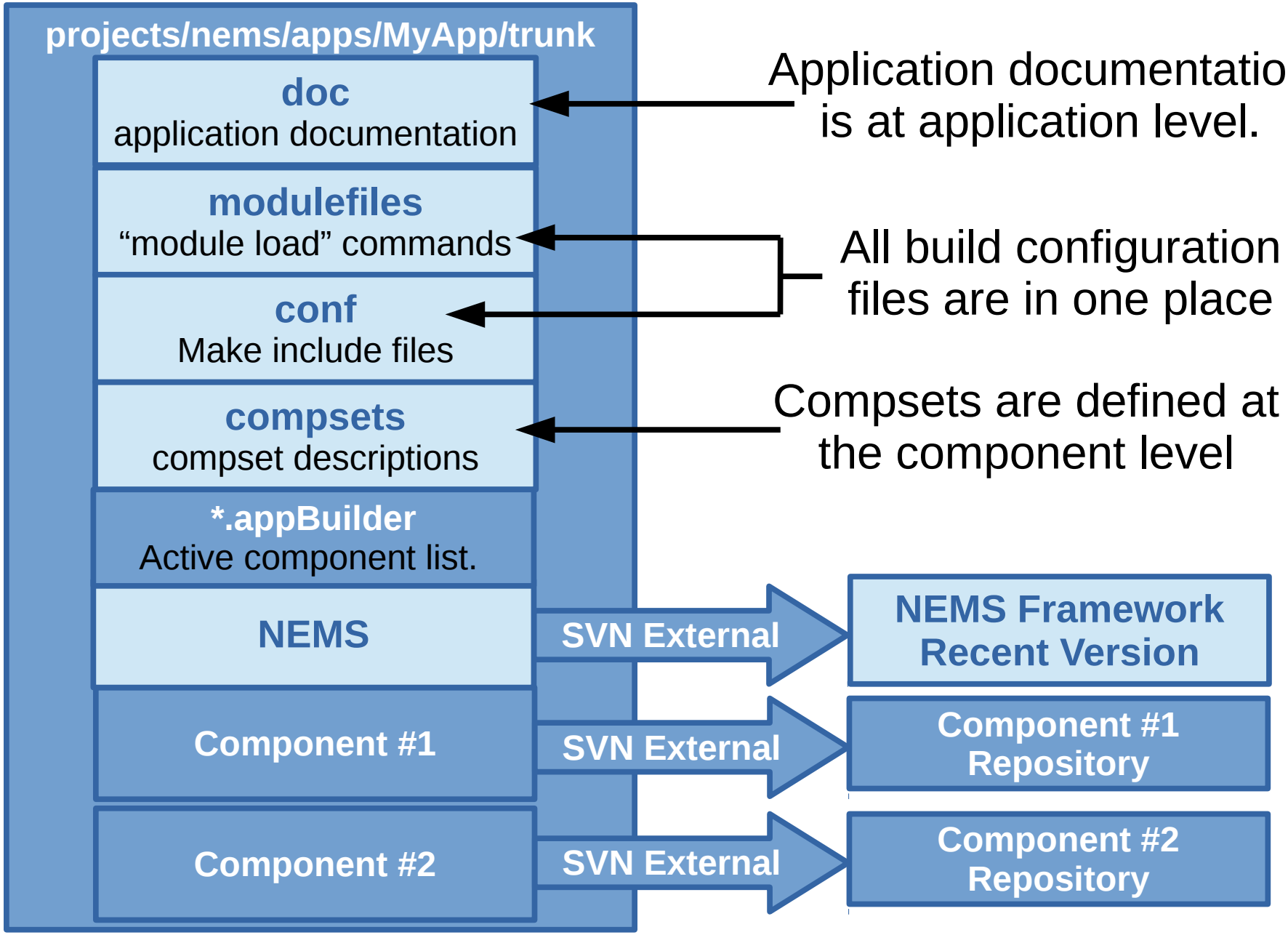
Repository, Execution, Build, and Commit Process

Sam Trahan
NCEP EMC / IMSG
July 19, 2017

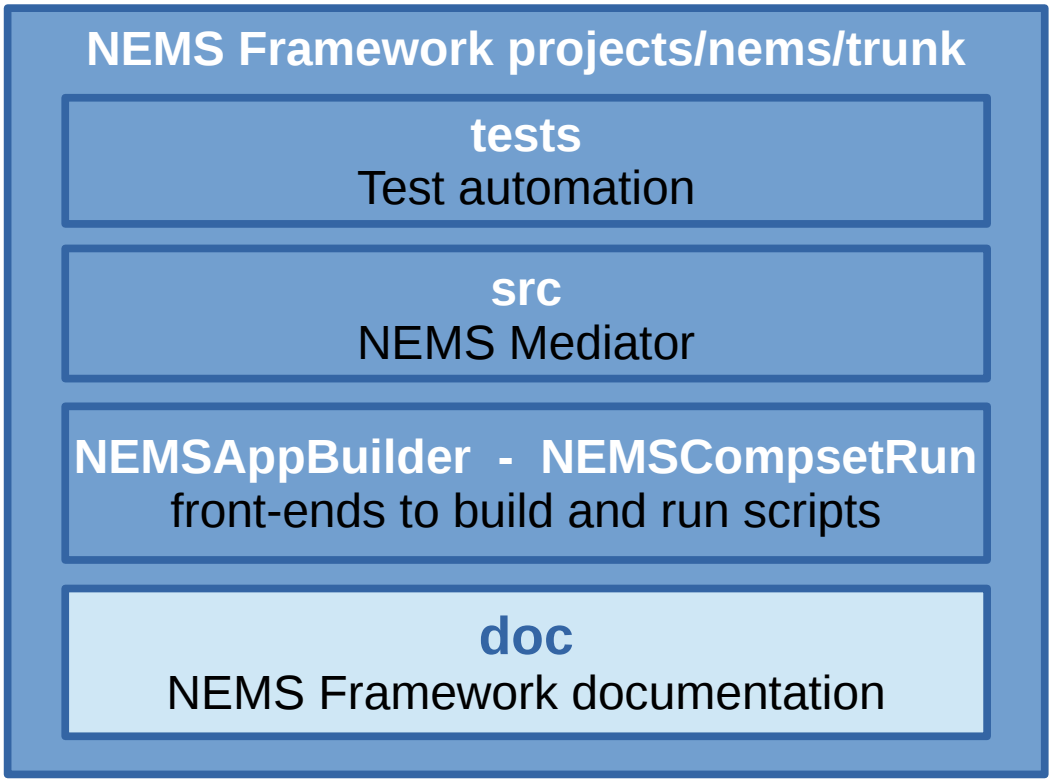
Overview

- NEMS Application & Repo
- NEMSAppBuilder
- NEMSCompsetRun
- Regression Tests
- Commit Process

NEMS Repository
Application

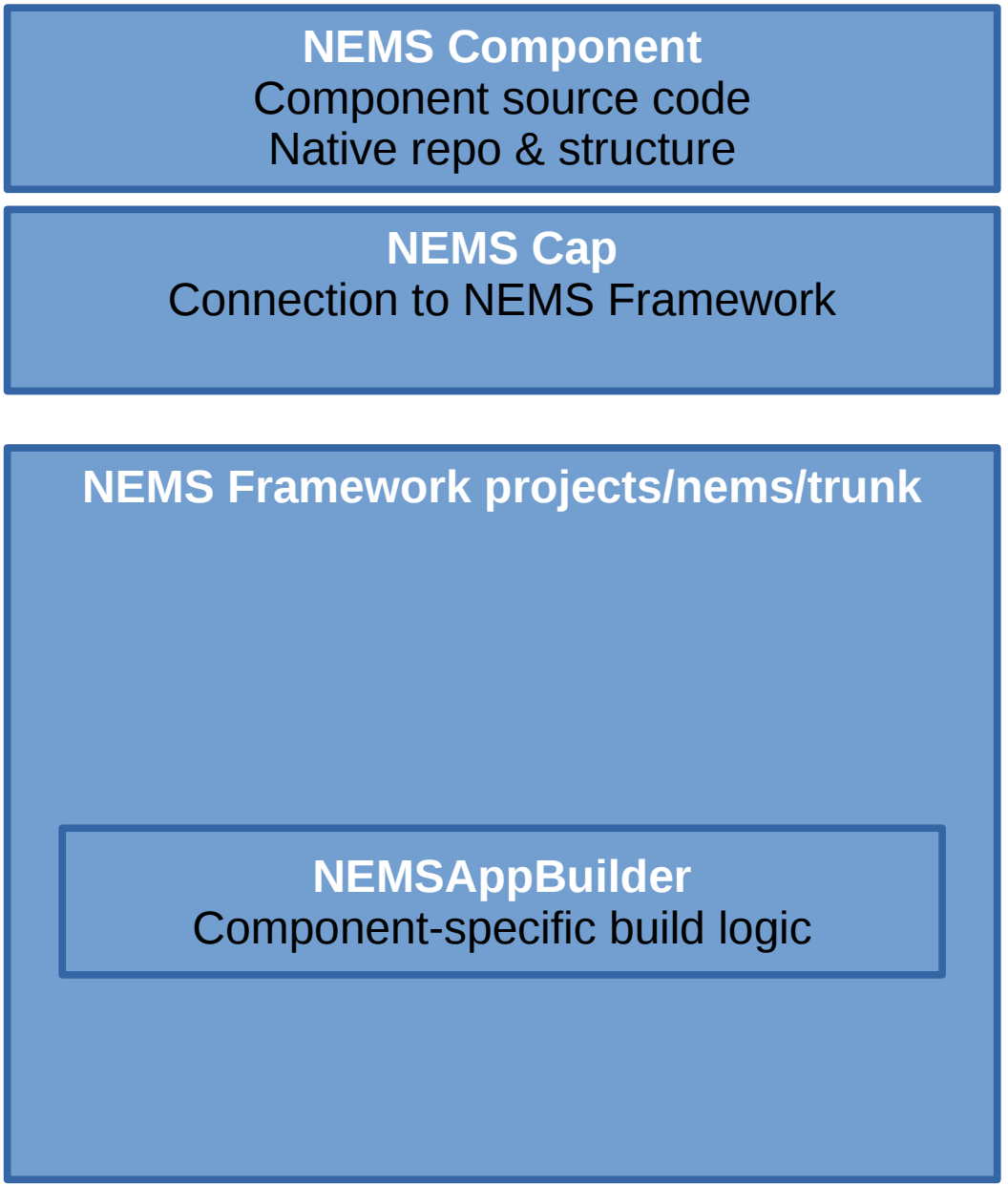


NEMS Repository
Framework



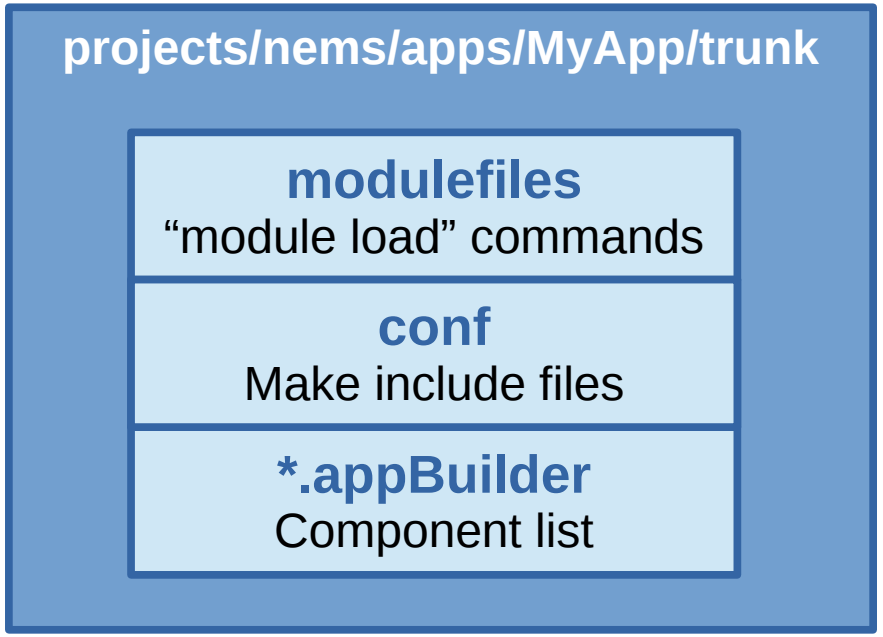
- No files specific to application
- Mediator source
- Test & build scripts
- Component-specific build logic

NEMS Repository
Component



- In 3 places:
  - Source code in native repo (any structure)
  - Cap connects to NEMS
  - Build logic in NEMSAppBuilder

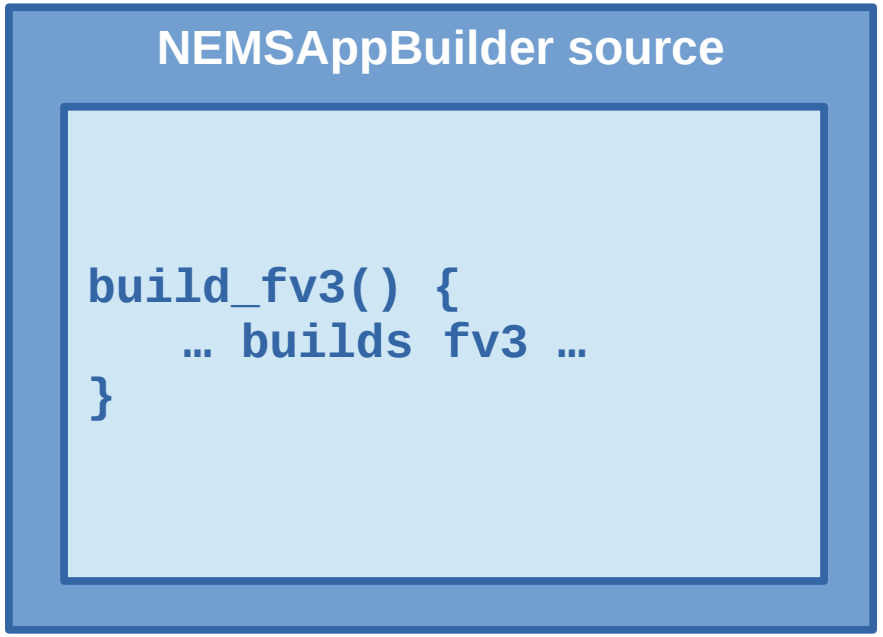
Compiling NEMS
NEMSAppBuilder



- ./NEMS/NEMSAppBuilder
  - interactive mode
- ./NEMS/NEMSAppBuilder app=standaloneFV3
  - Non-interactive. Logs to stdout/stderr

1. Component list from *.appBuilder file
2. Load modules from modulefiles/ directory
3. Configure NEMS using conf/ files
4.
5.

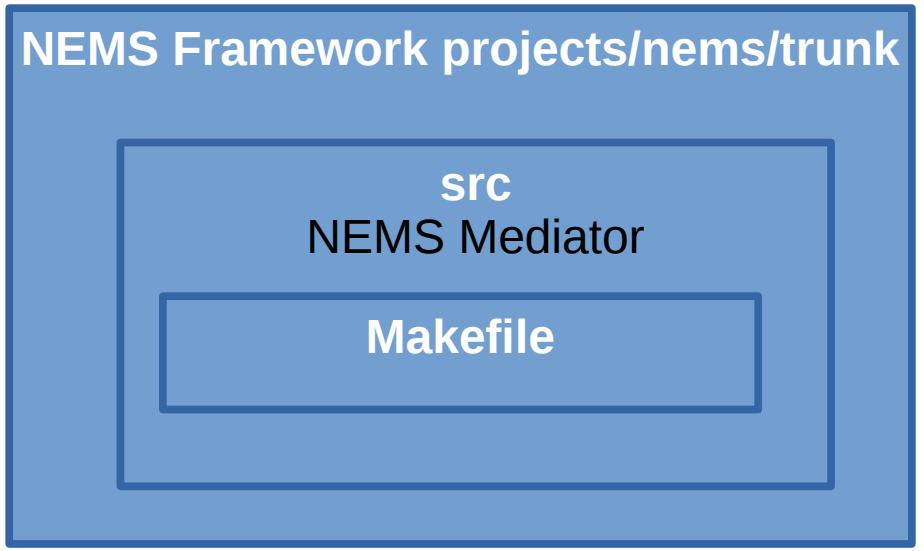
Compiling NEMS
NEMSAppBuilder



- ./NEMS/NEMSAppBuilder
  - interactive mode
- ./NEMS/NEMSAppBuilder app=standaloneFV3
  - Non-interactive. Logs to stdout/stderr

1. Component list from *.appBuilder file
2. Load modules from modulefiles/ directory
3. Configure NEMS using conf/ files
4. Build each component using shell function (eg build_fv3)
5.

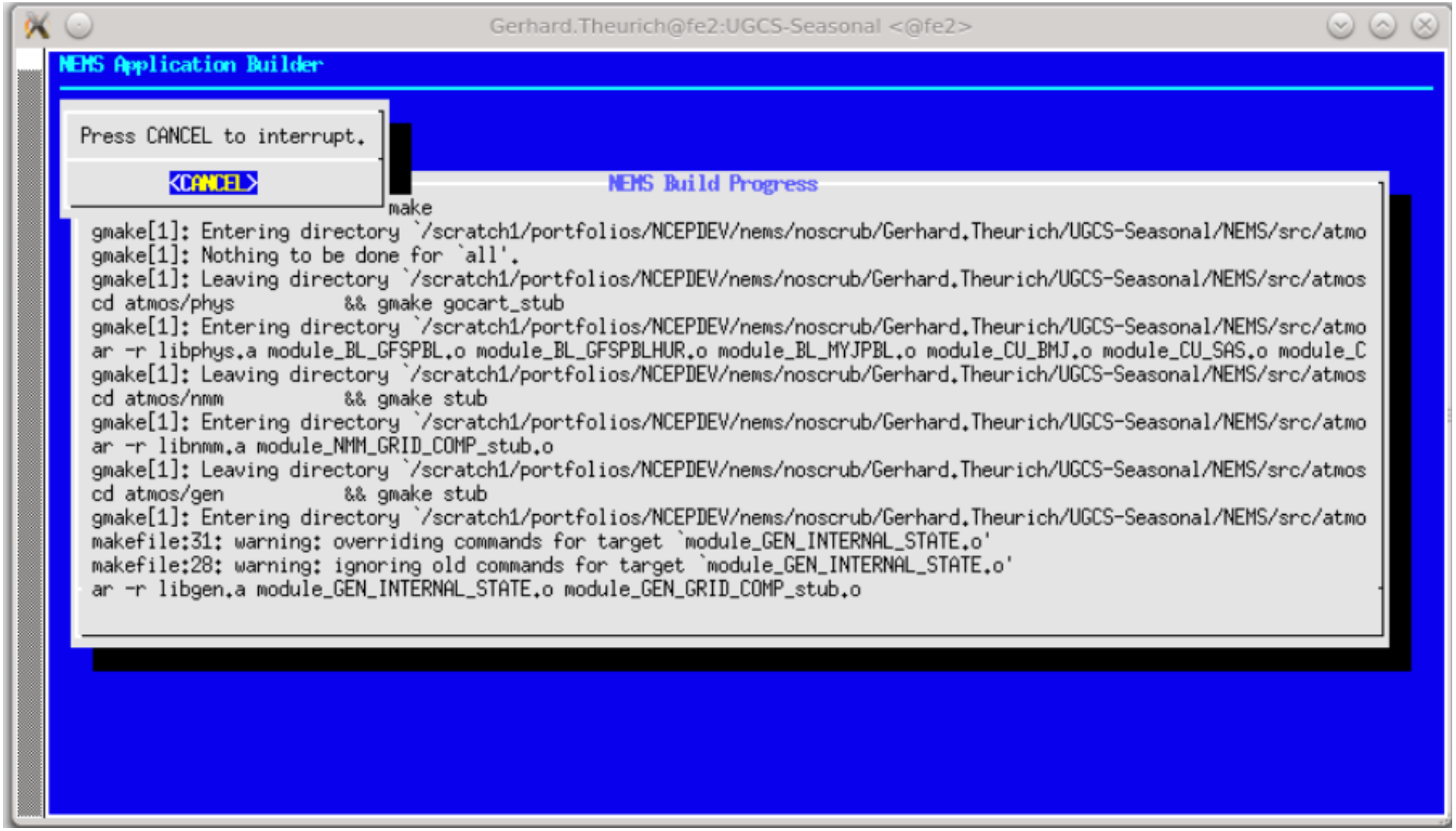
Compiling NEMS
NEMSAppBuilder



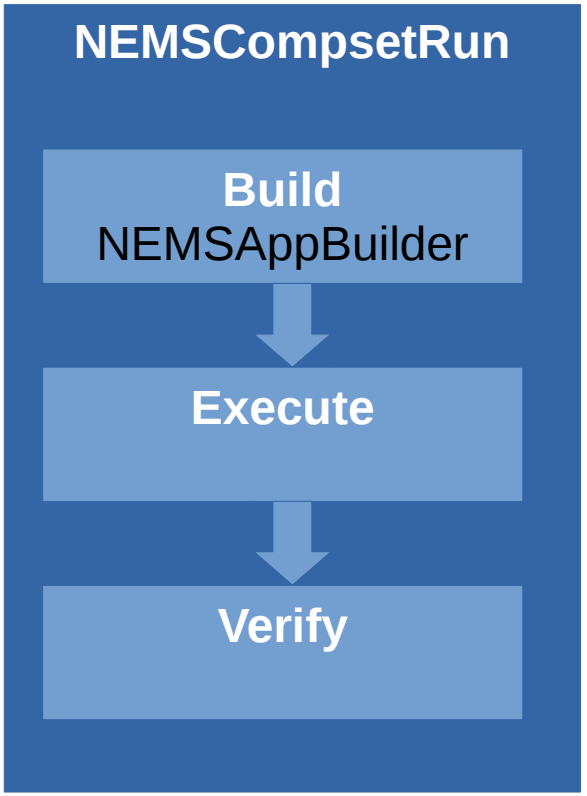
- ./NEMS/NEMSAppBuilder
  - interactive mode
- ./NEMS/NEMSAppBuilder app=standaloneFV3
  - Non-interactive. Logs to stdout/stderr

1. Component list from *.appBuilder file
2. Load modules from modulefiles/ directory
3. Configure NEMS using conf/ files
4. Build each component using shell function (eg build_fv3)
5. Build NEMS using NEMS/src/Makefile

Compiling NEMS
NEMSAppBuilder

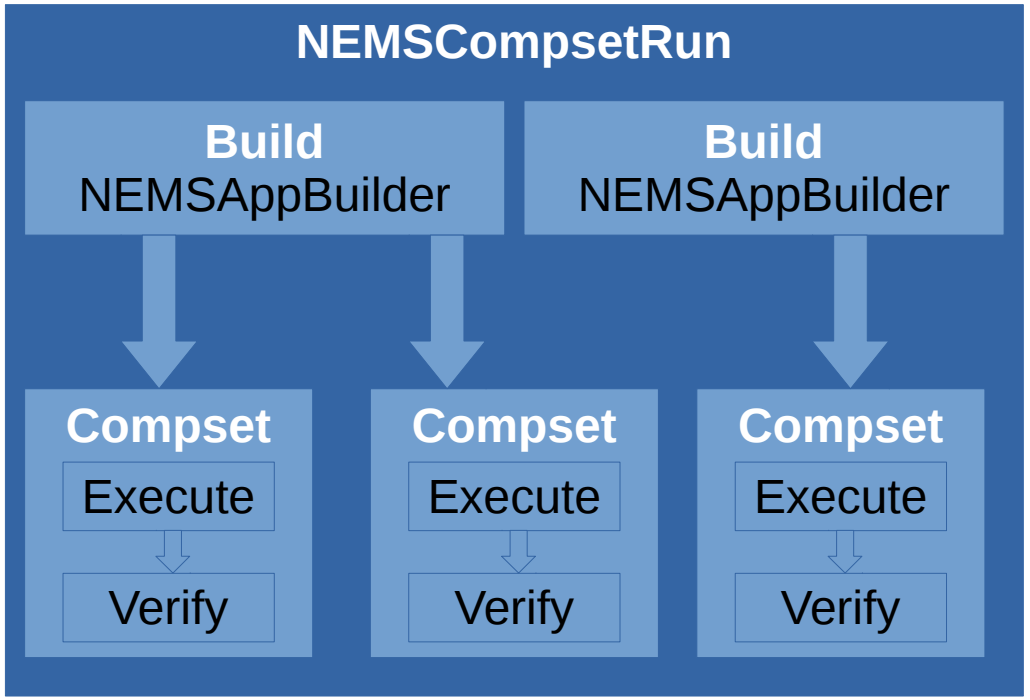


NEMSCompsetRun
Running NEMS



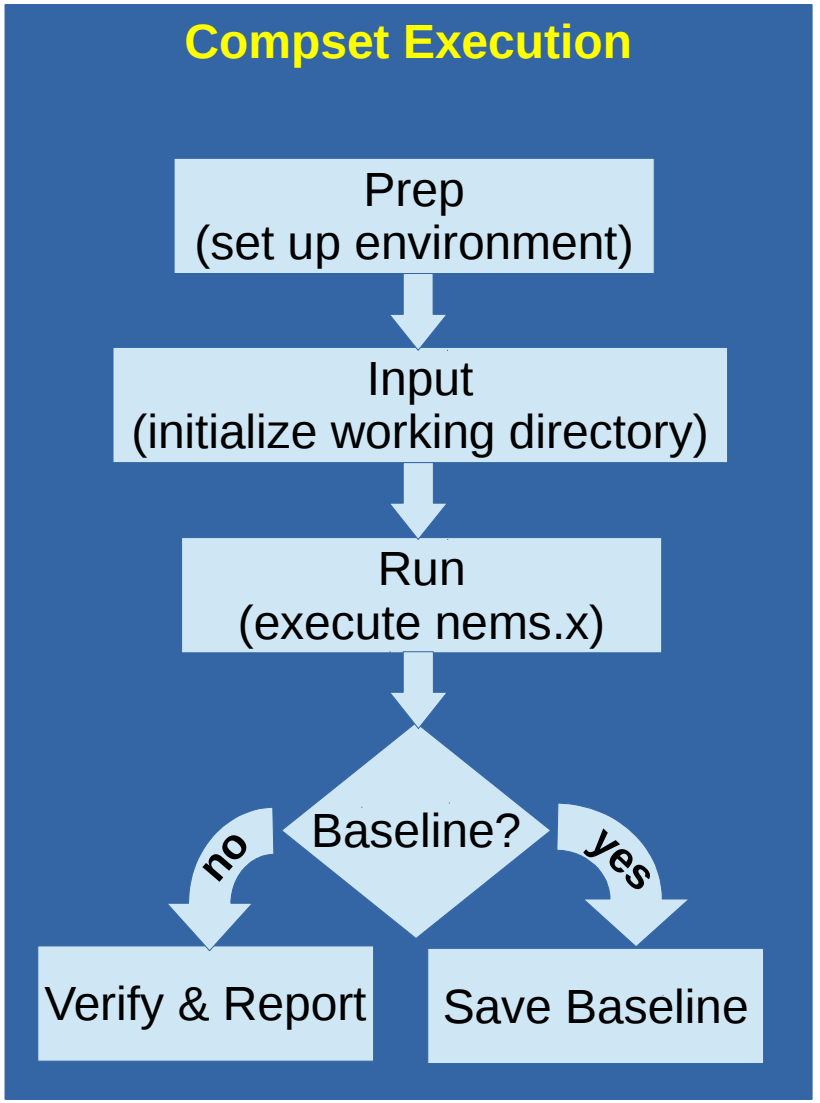
- Compset
  - Coupled component
  - Set
- Contains
  - Specified set of components
  - Inputs
  - Resource spec
  - Baseline

NEMSCompsetRun
Running NEMS



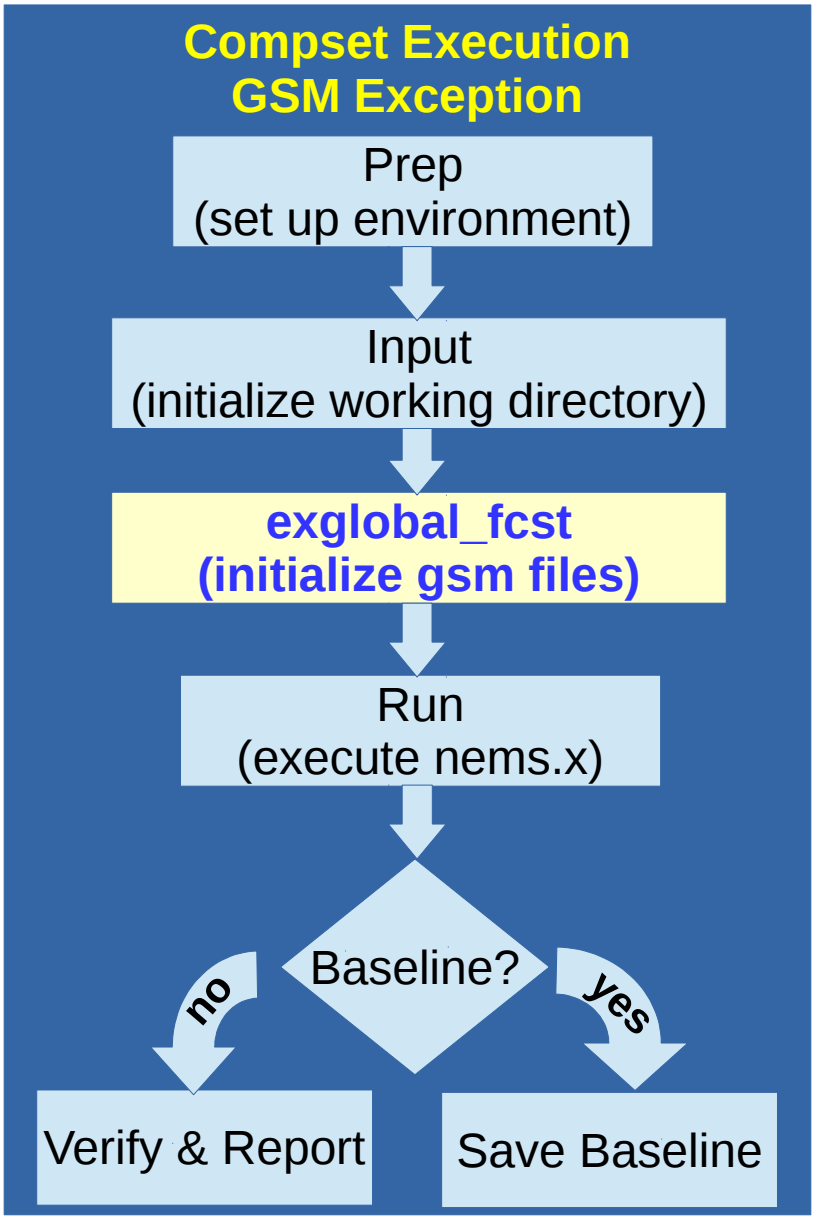
- Compset groups
  - Run multiple compsets
  - Multiple builds
- Excellent for regression testing

NEMSCompsetRun
Special Exception for GSM



- NEMSCompsetRun
  - No model workflow scripts
  - Simplifies cross-application, cross-platform, testing

NEMSCompsetRun
Special Exception for GSM



- NEMSCompsetRun
  - No model workflow scripts
  - Simplifies cross-application, cross-platform, testing
- GSM
  - initialization is too complex for users to understand
  - Unfeasible for users to separate input & output from gsm scripts.

NEMS Regression Tests

http://www.emc.ncep.noaa.gov/projects/rt

NEMS Regression Tests

Test	Result	Age	Duration
WCOSS NEMSGSM Trunk	PASS	25:22:49	01:01:23
Theia NEMSGSM Trunk	PASS	24:27:56	01:46:54
WCOSS WW3-GSM Trunk	PASS	25:34:49	00:49:27
Theia WW3-GSM Trunk	PASS	01:45:28	00:29:29
WCOSS NEMSfv3gfs Trunk	PASS	25:09:36	01:05:14
Theia NEMSfv3gfs Trunk	PASS	01:34:42	00:41:27

- Nightly regression tests
- More regression tests will be added in coming weeks:
  - FV3 Jet & WCOSS IBM
  - HYCOM-GSM-CICE
  - GSM-MOM5-CICE

NEMS Regression Tests

http://www.emc.ncep.noaa.gov/projects/rt

Theia NEMSfv3gfs Trunk Regression Tests: PASS

Start time: Wed, 19 Jul 2017 00:30:54 GMT (age 02:17:42)

End time: Wed, 19 Jul 2017 01:12:21 GMT (age 01:36:15)

Duration: 00:41:27

Source: regtest.txt. Click on a test or repo for details.

Legend: CHECKOUT - TEST PASSED - TEST **FAILED** - NEMS

Action	Result	Details (click for more info)
. (top of checkout)	-r 95864	https://svnemc.ncep.noaa.gov/projects/nems/apps/NEMSfv3gfs/trunk
FV3	-r 95134	https://svnemc.ncep.noaa.gov/projects/fv3/trunk
NEMS	-r 95629	https://svnemc.ncep.noaa.gov/projects/nems/trunk
COMPILE	SUCCEEDED	fv3.exe
COMPILE	SUCCEEDED	fv3_32bit.exe
COMPILE	SUCCEEDED	fv3_appbuilder.exe
fv3_decomp	PASS	Compare FV3 decomp results with previous trunk version
fv3_control	PASS	Compare FV3 control results with previous trunk version
fv3_2threads	PASS	Compare FV3 2 threads results with previous trunk version
fv3_stretched_nest	PASS	Stretched grid with nest; compare against previous baseline
fv3_read_inc	PASS	Compare FV3 read_inc results with previous trunk version
fv3_appbuilder	PASS	Compare FV3 with the NEMSAppBuilder against the previous trunk version
fv3_restart	PASS	Compare FV3 restart results with previous trunk version
fv3_stretched	PASS	Stretched grid; compare against previous baseline

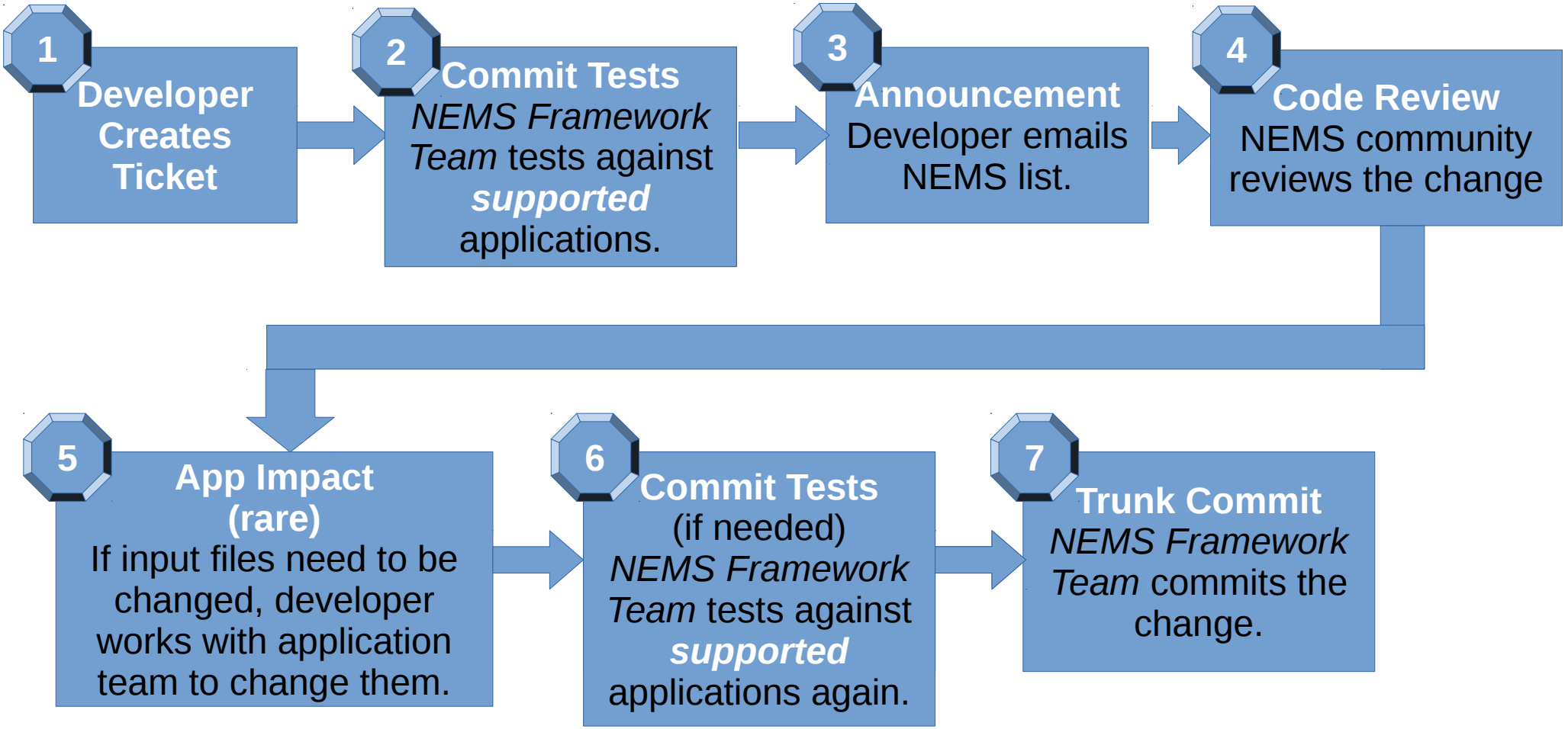
NEMS Regression Tests

http://www.emc.ncep.noaa.gov/projects/rt

Action	Result	Details (click for more info)
. (top of checkout)	-r 95864	https://svnemc.ncep.noaa.gov/projects/nems/apps/NEMSfv3gfs/trunk
FV3	-r 95134	https://svnemc.ncep.noaa.gov/projects/fv3/trunk
NEMS	-r 95629	https://svnemc.ncep.noaa.gov/projects/nems/trunk
COMPILE	SUCCEEDED	fv3.exe
COMPILE	SUCCEEDED	fv3_32bit.exe
COMPILE	SUCCEEDED	fv3_appbuilder.exe
fv3_decomp	PASS	Compare FV3 decomp results with previous trunk version • Wed Jul 19 00:53:22 UTC 2017 • atmos_4xdaily.tile1.nc: bit-for-bit identical • atmos_4xdaily.tile2.nc: bit-for-bit identical • atmos_4xdaily.tile3.nc: bit-for-bit identical • atmos_4xdaily.tile4.nc: bit-for-bit identical • atmos_4xdaily.tile5.nc: bit-for-bit identical • atmos_4xdaily.tile6.nc: bit-for-bit identical • nggps2d.tile1.nc: bit-for-bit identical • nggps2d.tile2.nc: bit-for-bit identical • nggps2d.tile3.nc: bit-for-bit identical • nggps2d.tile4.nc: bit-for-bit identical • nggps2d.tile5.nc: bit-for-bit identical • nggps2d.tile6.nc: bit-for-bit identical • nggps3d.tile1.nc: bit-for-bit identical • nggps3d.tile2.nc: bit-for-bit identical • nggps3d.tile3.nc: bit-for-bit identical • nggps3d.tile4.nc: bit-for-bit identical • nggps3d.tile5.nc: bit-for-bit identical • nggps3d.tile6.nc: bit-for-bit identical

Commit Process

Steps



- Ensures *Supported* applications can handle the commit.

Commit Process
Supported Applications

- Supported Applications:
  - Has an application team
    - at least one person
  - Trunk or “testing” branch:
    - Points to NEMS Framework trunk head
    - Has at least one compset that always works
    - Is maintained by the application team
  - Actively developed or used
  - Reasonably up to date with component trunks
    - Definition of “reasonably up to date” is outside the scope of this presentation

Commit Tests
NEMS Framework Team tests against ***supported*** applications.

Commit Process
Not Supported

- Do applications have to follow the plan?
  - No.
- What happens to apps that don't?
  - NEMS Framework commits will not be tested against the application.
  - Application developer keeps up with changes

Summary

- NEMS Application
  - Repo directory points to framework & components
- NEMSAppBuilder
  - Builds NEMS application based on app-level info
- NEMSCompsetRun
  - Runs compsets: set of components & inputs
  - Also used for regression testing
- Commit Process
  - Commit is tested against supported apps
  - To be supported, apps must follow rules